

GRASSLAND PRO HARROW

GP 300 M1

OPERATING MANUAL



PLEASE READ CAREFULLY BEFORE COMMISSIONING!

Translation of the original operating manual

Version: 1.9 EN; item number: 00601-3-675



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1 EC DECLARATION OF CONFORMITY

according to Machinery Directive 2006/42/EC
and Low Voltage Directive 2006/95/EC



APV-Technische Produkte GmbH
Dallein 15
A-3753 Hötzelstdorf

hereby declares that the mounted implement described in the following complies with the applicable basic safety and health requirements of the above-mentioned Directives in terms of its concept and design as well as the versions put on the market.

This declaration loses its validity if there are any changes to the mounted implement that are not approved by APV - Technische Produkte GmbH.

Designation of the mounted implement model series:
Grassland regeneration harrow GP 300 M1

Serial numbers:

Starting at 06001-01000 – starting at 06002-01000 – starting at 06005-01000 - starting at 06006-01000

Year of manufacture: as of **2015**

Relevant EC Directives:

Directive for machinery – Machinery Directive 2006/42/EC

For the planning, design, construction and marketing of the mounted implement, the following harmonised European standards were applied in addition to the Directives, in particular:

EN ISO 12100:2010 – Safety of machinery, general principles for risk assessment
ISO 13857:2020 Safety distances to prevent hazard zones being reached by upper and lower limbs
ISO 13849-1:2015 Safety of machinery - Safety-related parts of control systems

Responsible for the technical documentation: Planning and Design department, Dallein 15

Ing. Jürgen Schöls
Managing Director
(authorised person in the EU)

Dallein/Hötzelstdorf, 13.02.2023

2 UK CONFORMITY ASSESSED

according to Machinery Directive 2006/42/EC
and Low Voltage Directive 2006/95/EC



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Responsible for the technical documentation: Planning and Design department, Dallein 15

A handwritten signature in black ink, appearing to read 'Jürgen Schöls', written in a cursive style.

Ing. Jürgen Schöls
Managing Director
(authorised person in the EU)

Dallein/Hötzelstdorf, 13.02.2023

3 IDENTIFICATION OF THE IMPLEMENT

The Grassland Pro Harrow GP 300 M1 can be uniquely identified through the following information on the type plate.

- Designation
- Model
- Production number

Position of the type plate

The type plate is located on the left of the centre frame (viewed in the direction of travel) (see Figure 1).

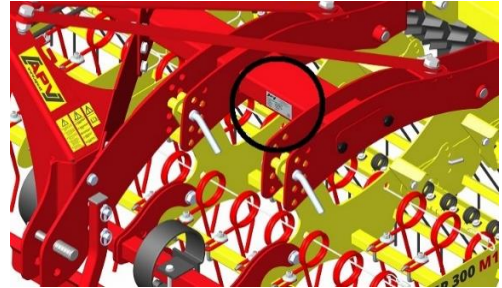


Figure 1: Position of the type plate

The following image (Figure 2) shows the layout of the type plate.



Figure 2: Layout of the type plate

The data on the type plate have the following meaning:

- 1: Designation
- 2: Model
- 3: Product number / serial number
- 4: Weight
- 5: Year of manufacture



NOTE!

In cases of inquiries or warranty claims, please always tell us the production number / serial number of your implement.



PLEASE NOTE!

Misprints, errors and omissions excepted!

4 SERVICE

Please contact our service address in the following cases:

- If you still have questions regarding the handling of this implement despite the information provided in this operating manual
- For questions regarding spare parts
- To order maintenance and servicing work

Service address:

APV - Technische Produkte GmbH
Zentrale: Dallein 15
A-3753 Hötzelndorf
AUSTRIA

Telephone: +43 2913 8001-5500
Fax: +43 2913 8002
Email: service@apv.at
Web: www.apv.at

5 WARRANTY

Please check the implement for any transport damage immediately upon receipt. Later claims regarding transport damage can no longer be considered.

Based on a warranty activation (see Point **Fehler! Verweisquelle konnte nicht gefunden werden.**), we grant a six-month factory warranty starting on the date of initial operation (your invoice is the warranty certificate).

This warranty is applicable for cases of material or construction faults and does not include parts that are damaged by normal or excessive wear.

The warranty expires

- if damage is caused by external forces.
- in cases of operating errors.
- if the kW/HP limits are significantly exceeded.
- if the implement is modified, expanded or equipped with third-party spare parts without our permission.

5.1 WARRANTY ACTIVATION

Every APV implement must be registered immediately after delivery. The registration activates the claim for warranty services and APV can guarantee the best service.

To activate the warranty for your implement, simply scan the QR code with your smartphone - you will then be taken directly to the service area on our website.



Of course, you can also activate the warranty through our website www.apv.at in the service area.

6 SAFETY INFORMATION

This chapter contains general rules of conduct for the intended use of the implement and safety-related information that should always be observed for your safety.

The list is very extensive, and some of the information does not apply exclusively to the delivered implement. However, the summary of the information often reminds you of unconsciously neglected safety regulations for the everyday operation of machines and implements.

6.1 INTENDED USE

The implement is designed solely for normal use in agricultural operations.

Any other use is considered to be non-intended. The manufacturer is not liable for any resulting damage, the operator alone bears the associated risk.

Intended use also includes compliance with the conditions for operation, maintenance, and repairs prescribed by the manufacturer.

The implement may only be used, maintained and repaired by persons who have relevant experience and were instructed on the risks. The safety instructions must also be handed over to other users.

The applicable, country-specific accident prevention regulations as well as the other generally safety-related, occupational health and road traffic regulations must also be observed.

The manufacturer is not liable for any damage resulting from unauthorised modifications and the use of components and auxiliary parts. This causes the declaration of conformity to lose its validity.

6.2 GENERAL SAFETY-RELATED INSTRUCTIONS AND ACCIDENT PREVENTION REGULATIONS

- The warning and information signs applied to the implement provide important instructions for safe operation. These may not be removed in any case, observe them for the sake of your own safety!
- There are pinch and shear points on externally powered (e.g. hydraulic) parts!
- People must not be carried on the implement during intended use on agricultural land and when driving on roads.
- Triggers for fast couplers must be hanging loosely and must not trigger themselves when lowered.
- Observe the generally applicable safety and accident prevention regulations for the respective country!
- Transport of the implement on public roads requires compliance with the respective national licensing regulations and road traffic regulations.
- When implement parts are moving (e.g. during the folding or pre-tensioning procedure) it must be ensured that there is no one standing in the danger zone of the implement – there is a risk of crushing.
- When using the platform kit, it must be ensured that the implement is at a standstill, is unfolded, and lowered onto the ground.
- During assembly, the operator must ensure that the requirements for the tractor in terms of the power, total weight, transport dimensions, axle loads and weight distribution as specified in the operating manual are met and that the connections specified in the operating manual are correctly established.
- When driving through low or narrow obstacles (e.g. power lines, underpasses, etc.), attention must be paid to the height and width of the implement to avoid collisions.
- When driving on public roads, which is only permitted with the chassis extended (both wheels) and with the side wings folded as well as the roller retracted (hydraulic cylinder for roller adjustment is completely retracted), the control block on the chassis cylinder prevents lowering of the Grassland Pro Harrow as well as of the folded up components (additionally secured with catch hooks), also in case of failure of the tractor hydraulic system.
- When driving in curves, take account of the wide radius and/or the centrifugal mass of the implement! Pay attention when turning the tractor!
- Additional lighting (e.g., flashlight) should be used for repair or maintenance work if necessary.
- For implements that are driven rapidly with soil-driven tools: Danger after lifting due to the still rotating centrifugal mass! Only approach the implement when it has come to a standstill!
- In case of loss or breakage of implement parts, they must be immediately replaced with original parts by trained specialist personnel.
- When mounting and dismounting, put the support devices in their respective positions (stability)!
- Special care must be taken when coupling and uncoupling implement to and from the tractor!
- Do not use the implement if you are tired or under the influence of drugs, alcohol or medication.
- Climbing onto the implement or walking on the implement is only allowed if a platform kit is installed.
- The implement may only be used on agricultural land. It may not be used on normal road surfaces, on asphalt or concrete. In particular, the implement may not be used in the building industry on construction sites, for winter services, for road construction, or for underground mining.
- The implement must only be used by competent personnel who are informed of the danger zones and who are familiar with the regulations for transport on public roads. The owner is responsible for regularly monitoring user competence
- The implement is intended for outdoor operation in dry weather, within a temperature range from +5 °C to 40 °C. Water penetration must be avoided. The implement must not be used in rain, thunderstorms and/or stormy conditions and it must be parked under a shelter.
- It is not allowed to carry passengers on the implement during operation and transport!
- Do not transport work materials on the implement, except for seed in the hopper of a possibly mounted Pneumatic Seeder.
- Accessories must be mounted in compliance with the standards by qualified specialist personnel from an authorised company.
- It is forbidden to stand in the working area of the implement!

- The operator/user must ensure that no one is standing in the vicinity of the implement, when it or its components are moved via the tractor hydraulic system or when the roller is being lifted or lowered. Visual check by the driver!
- With initial use of the implement, the operator/user confirms that they have read and fully understood this operating manual.
- When mounting the implement, the operator/user must connect the Grassland Pro Harrow to the tractor by means of a metallic connection (ensured by the lower link).
- The operator must train and instruct their personnel prior to first use of the implement. Personnel/users must have read and understood the operating manual before handling the implement.
- The owner of the implement
- When mounting the implement, the operator/user must ensure that connections to the tractor hydraulic system are clean and carefully connected.
- The operator/user should wear tight-fitting clothing! Avoid wearing loose clothes!
- The instructions concerning assembly as well as the requirements concerning the tractor as specified in the operating manual are to be observed.
- The forward speed of the tractor may not exceed 12 km/h when performing field passes.
- The implements must be checked regularly by the operator/user (before each use) for any fractures and cracks, chafe marks, leaks, loose bolts and connections, vibrations, unusual noises, and for correct function.
- The view on the mounted implement and the hazardous movement area must be clear to check the procedure.
- Folded frames and lifting devices must be locked in transport position!
- It must be ensured that the hydraulic couplings are not soiled.
- Always wear protective goggles, hearing protection, and tight-fitting protective work gloves when performing coupling tasks (compressed air connections, hydraulic connections, etc.).
- The driving behaviour, steering and braking capacity are affected by mounted or towed implements and ballast weights. For this reason, always ensure sufficient steering and braking capacity!
- When passing on the implement, be sure to pass on the operating manual.
- Always secure the parked implement against unintentional rolling.
- The implement may only be operated when all of the protective devices are installed and in safety position!
- The implement must be coupled according to the instructions and only onto the specified devices!
- Always attach ballast weights at the intended attachment points according to the specifications!
- Always keep the operating manual close to the implement for reference purposes.
- Hydraulic folding frames may only be actuated when nobody is standing in the swivelling range.
- Maintenance, repair, and cleaning work as well as the elimination of malfunctions should always be performed when the drive is switched off, the engine is at a standstill, and after verifying that there is no voltage!
- Inspections must be performed before operation or as part of regular care and maintenance of the implement.
- Do not stand near rotating and swivelling parts of the implement!
- Always keep hands, clothing etc. away from rotating parts!
- Transport equipment - e.g. lighting, warning signs and any protective equipment, must be checked and mounted!
- Working under the implement is forbidden, especially when it is lifted.
- Before starting work, get to know all of the equipment and operating elements as well as their functions. It is too late to do so during operation!
- Always perform a visual inspection of the mechanical folding lock before start-up.
- Check the immediate surroundings (watch out for children) before start-up! Ensure that you have an adequate view!
- Before exiting the tractor, activate the brake on the implement, prevent unintentional rolling away, switch off the engine, and remove the ignition key!
- Before each use, check the folding device and its securing elements for proper function and effect.

- Check the implement and the tractor for road and operational safety before every use (e.g. defective parts, connections, hoses, protective equipment, etc.)!
- Never leave the driver's platform while driving!
- Observe the permissible axle load, total weight and transport dimensions!
- Keep the implements clean to reduce the risk of fire!
- Standing between the tractor and the implement is forbidden unless the vehicle is secured against rolling away using the parking brake and/or with wheel chocks!

6.3 MOUNTED IMPLEMENTS

- Only APV implements and accessories may be mounted on the implement.
- Do not stand between the tractor and the implement when actuating the external controls for the three-point mounting!
- When driving on roads, which is only permitted with the implement lifted and with folded side frames, a load-holding valve on the chassis cylinder prevents lowering of the implement and lowering of the folded side frames by means of a mechanical folding lock. Moreover, the roller frame (with hydraulic cylinder) and the tines (mechanically) must be completely lowered.
- The mechanical folding lock prevents unintentional lowering of the side frame during road transport in the event of failure of the tractor hydraulic system.
- When driving on roads with the implement lifted, the operating lever must be locked against lowering!
- For three-point mounting, the mounting categories of the tractor and the implement must match or be adapted!
- Mounting of any sort of accessories onto the implement must be performed according to standards. The maximum permitted mounted weight / total weight of the implement must not be exceeded.
- There is a risk of injury due to crushing and shearing points in the area of the three-point linkage!
- When the implement is in transport position, always ensure that the tractor three-point linkage is sufficiently locked to the sides! If necessary, brace the lower link to prevent oscillation of the implement.
- Before mounting and dismounting implements on the three-point linkage, the operating devices must be moved into the correct position that excludes unintentional lifting or lowering!

6.4 HYDRAULIC SYSTEM

- Due to the risk of injury, use suitable tools when searching for leaks!
- For hydraulic function connections between the tractor and implement, coupling sleeves and coupling connectors should be marked to exclude the possibility of operating errors! If the connections are interchanged, the function will be inverted (e.g. lifting/lowering)! – Danger of accident!
- When connecting hydraulic cylinders and motors, the specified connection of the hydraulic hoses must be observed.
- When connecting the hydraulic hoses to the tractor hydraulic system, make sure that the hydraulic system on the tractor and implement side is unpressurised!
- The hydraulic system is under high pressure during operation! Only disconnect hydraulic hoses once the hydraulic system on the towing vehicle and the implement is depressurised.
- Inspect the hydraulic hose lines at regular intervals and replace in case of damage or wear! The replacement lines must comply with the technical requirements of the implement manufacturer!
- Liquids that escape under high pressure (hydraulic oil) can penetrate the skin and cause severe or fatal injuries! Consult a doctor immediately in case of injury! (Danger of infection, blood poisoning!)
- Before working on the hydraulic system, lower the implement onto the ground, depressurise the system, and switch off the engine!

6.5 MAINTENANCE

- When performing electrical welding work on the tractor and mounted implement, disconnect the cable on the generator and the battery!
- Additional lighting (e.g., flashlight) should be used for repair or maintenance work if necessary.
- It must be replaced immediately before working with the implement in case of damage.

- When performing maintenance on the lifted implement, always ensure safety against lowering through suitable support elements!
- Use suitable tools, protective goggles and cut-resistant gloves when replacing work tools with sharp edges!
- Replacing components that cannot be removed with tools such as a screwdriver or wrench may only be replaced by qualified specialist personnel from an appropriately authorised company or by APV Customer Service.
- The implement must be checked regularly by the operator (before every use) for any fractures and cracks, leaks, chafe marks, loose bolts and connections, vibrations and to ensure it functions correctly.
- The implements should be regularly lubricated and cleaned using water or compressed air. While doing this, personal protective equipment should be worn if necessary.
- Cleaning, maintenance, and servicing work must be performed with the implement lowered, engine switched off, and safeguarded to prevent it from being switched on again.
- The maintenance work itself may only be performed by trained specialist personnel and may never be performed alone. Extreme caution must be taken when changing defective components or tools.
- Spare parts must at least comply with the technical requirements specified by the implement manufacturer! This is ensured with original parts!
- We recommend a gentle cleaning as specified in the maintenance manual. The procedure in in maintenance manual must be observed and protective equipment must be used.
- Maintenance, repair, and cleaning work as well as the elimination of malfunctions should always be performed when the drive is switched off and the motor is at a standstill and the implement is uncoupled from the towing vehicle! Remove the ignition key! Check to ensure that there is no voltage!
- Check the nuts and bolts regularly for tight fit and retighten if necessary!
- Properly dispose of oils, greases, and filters in accordance with national regulations!
- If repair or maintenance work is required on the implement, this work must be identified by a clearly visible information sign "Caution: maintenance work".
- Working under the implement is forbidden!
- Always cut the power supply when working on the electrical system!
- Maintain a safe distance from the implement during possible continued motion due to centrifugal mass. Work can only be performed when it comes to a complete standstill.

6.6 TYRES

- When working on the tyres, it must be ensured that the implement is safely parked and secured against rolling away (wheel chocks).
- The mounting of wheels and tyres requires sufficient knowledge and proper installation tools.
- Check the inflation pressure regularly.
- Regularly check wheel nuts for firm seating and the required torque, and retighten if necessary.
- Repair work on the tyres may only be performed by specialists and with suitable installation tools.

6.7 MOUNTED SEEDERS

- When using a seeder, all of the specifications of the implement manufacturer must be observed.
- The seeder can be easily reached with using a step and platform. They must be clean and dry during use.
- The platform kit must only be used as a maintenance walkway.
- An ascent must be established conforming to the standards. This ascent is available from APV.
- When not in use, the steps must be folded up and secured.
- It is strictly forbidden to stand on the platform or its steps while driving.

6.7.1 FILLING THE SEEDER

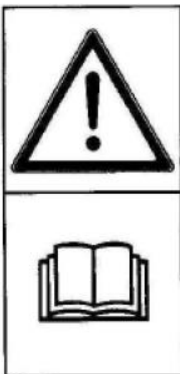
- When filling the seeder, never stand under a suspended load!
- When driving up to the implement with seed, nobody may be standing on or around the implement.
- The seeder may only be filled using a filling auger or a supply vehicle.
- The platform kit may not be used to fill the seeder or as a storage area for objects or seed.

- During the loading procedure, avoid any contact with the treated seed and wear gloves, a dust mask and safety glasses.

PLEASE NOTE!
Misprints, errors and omissions excepted.

7 INFORMATION SIGNS / HAZARD LABELS

Pay special attention to the stickers on the implement, as they warn you of specific dangers!



Read and observe the operating manual before operating the implement!



Do not stand on the implement while driving!



Be careful with escaping high-pressure liquids! Observe the instructions in the operating manual!



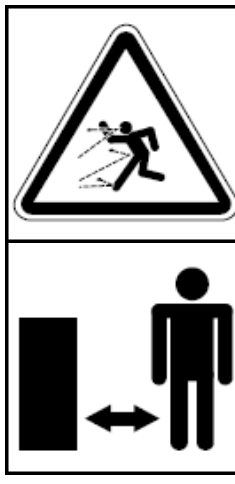
Always switch off the engine and remove the key before maintenance work!



Never reach into the crushing danger zone as long as the parts can still move!



Do not stand between the machines when connecting the GP 300 and actuating the hydraulic system!



Danger due to thrown parts; observe the safety distance!



Do not climb onto rotating parts, use the intended access ladders!



Loading hooks.

When loading the implement, attach the ropes or chains to these points!

8 OPERATING MANUAL

8.1 MOUNTING ON THE TRACTOR

- The air pressure in the rear tractor tyres should be 0.8 bar during operation. If the tyres have a lower load capacity, increase the pressure.
- Under difficult operating conditions, additional wheel weights can be useful. Please also refer to the operating manual from the tractor manufacturer.
- The tractor should be equipped with sufficient ballast weight at the front to ensure the steering and braking capacity. At least 20% of the empty vehicle weight is required on the front axle.
- The lifting struts must be adjusted to the same height on the left and on the right.
- Mount the implement on the 3-point linkage of the tractor.
- Mount the top link so that it slants down towards the tractor during operation. Observe also the sticker on the implement. (Observe the specifications from the tractor manufacturer.)
- After coupling the lower links, turn around the parking support by pulling out the pin, and then reposition and secure it (see Figure 3 and Figure 4).



Figure 3

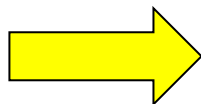


Figure 4

- Connect the hydraulic hoses to a double-acting control unit. During connection, make sure that the hoses are unpressurised both on the tractor and implement sides.

9 LAYOUT AND MODE OF OPERATION



1	Cambridge roller
2	Tine brackets
3	8 mm tines
4	Tines 10 or 12 mm
5	Levelling plate
6	Cat II three-point linkage
7	roller cylinder

Figure 5

Thanks to its robust and compact design, the Grassland Pro Harrow GP 300 M1 is ideal for new seeding, reseeding, and controlling grass weeds on grassland.

The height-adjustable levelling plate removes coarse unevenness in the grassland and spares the tines unnecessary strain.

Due to the tight line spacing of the individual tines (75 mm for 10 mm or 12 mm tines and 50 mm for 8 mm tines), the sward is optimally prepared and the plants can germinate rapidly after reseeding.

With the high contact pressure of the utilised roller, seed soil contact is improved and the nutrient supply to the reseeded plants is optimised.

To obtain the best possible rolling results, a forward speed of 8 km/h should not be exceeded. A speed of 6-12 km/h is ideal for grassland.

10 WORKING POSITION AND SETTING THE WORKING DEPTH

10.1 DEPTH SETTING

2 work steps are required to adjust the depth of the GP 300 M1:

1. Depending on how aggressively you want to work the soil, add or remove the hydro clips from the roller cylinder. To do so, you must extend the cylinder a little so that the hydro clips are hanging freely on the cylinder. When you have inserted the desired number and strength, retract the cylinder again up to the stop.
2. The lower link must be positioned such that the frame of the implement is horizontal to the field. Reference points for this are the shaped tube (160 x 80 mm) or the Pneumatic Spreader (it should be positioned vertically to the field).

During operation, the top link on the implement side must always be attached in the elongated slot. For normal operation, the pin should be in the middle of the elongated slot. If you want to use the GP 300 M1 with the roller lifted, i.e. the roller in the highest position and the roller cylinder completely retracted, you must firmly attach the top link on the implement side.

10.2 ADJUSTING THE SERIES OF HOLES

In addition to the depth, the aggressiveness of the tines relative to one another on the GP 300 M1 can also be changed. To do so, you only have to insert the pins for the tine sections as desired in a higher or lower hole (see Figure 6).

This makes it possible to adjust the 10 mm and the 8 mm tines at different degrees of aggressiveness. This also allows for compensation of various degrees of wear on the tines.



Figure 6: Series of holes

The two front tine rows tear up the sward. The rear tine rows produce an optimal seedbed for the new grasses. If the front row of tines should work more aggressively (e.g. under hard soil conditions), you must insert the pin in one of the bottom holes. On soft soils or wet conditions, you can have only the rear tines working by adjusting the series of holes higher up.

After this adjustment, you also have the option of changing the work pattern of the rear tines.

For this purpose, you can select one of four levels. At an optimal forward speed, the tines make an elliptical motion. The steeper the position of the tines, the smaller the motion. The flatter the position of the tines, the larger the motion. If the sward is dense and intense tillage is required, the tines should be positioned more steeply (see Figure 7).



Figure 7: Aggressiveness adjustment

10.3 LEVELLING PLATE

The levelling plate eliminates molehills after the winter and serve to roughly level the grassland. The height should be adjusted so that it runs along the sward just above the ground. It should not scratch into the sod. However, if the sod is very uneven, allowing the levelling board to slightly penetrate into the soil can improve the levelling effect on the long term.

10.4 USE OF INDIVIDUAL TOOLS

With the GP 300 M1, it is possible to use the individual tools

- Levelling plate
- Harrow
- Roller

Separately or in any combination. For example: you can use the roller alone by completely extending the roller cylinder. In this way, you can also use the implement in field crops for rolling after cultivation (see Figure 6).

If you only want to level and roll, position the roller and the levelling plate all the way down so that the tine section is lifted off the ground.

11 MAINTENANCE AND CARE

11.1 GENERAL

To maintain the implement in good condition even after a long service life, the following instructions must be observed:

- In chapter 6.5, you will find some basic safety regulations for maintenance work.
- Original parts and accessories are designed especially for the machines or implements.
- Please note that spare parts and accessories not supplied by us have also not been tested and approved by us.
- The installation or use of such products can therefore possibly negatively change or impede the constructional properties of your implement. The manufacturer rules out any liability for damages resulting from the use of non-original parts and accessories.
- The manufacturer is not liable for any unauthorised modifications and the use of components and auxiliary parts.
- All bolted connections should be re-tightened at the latest after 3 operating hours and again after 20 hours, and then checked regularly. Loose bolts can cause significant consequential damage, which is not covered by the warranty.
- The grease points on the joints and bearings must be lubricated regularly (approx. every 10 operating hours with universal grease).
- For implements with fast coupler, the guide slots must also be lubricated.
- After the first 10 operating hours and subsequently every 50 operating hours, the hydraulic units, hydraulic hoses and couplings must be checked for leaks and the bolted connections must be tightened if necessary.
- Check the hydraulic hoses for wear before every operation.
- Caution!! Liquids escaping under high pressure can penetrate the skin. For this reason, a physician must be consulted immediately in case of accident!
- After cleaning, lubricate all of the grease points and distribute the grease evenly in the bearing points (e.g. perform a short test run).
- Do not use a high pressure cleaner to clean bearing and hydraulic parts.
- The paint can be damaged by cleaning with excessive pressure.
- During the winter, the implement should be protected against rust with an environmentally-friendly product.
- Park the implement protected from weather conditions.
- Put down the implement in a way that the tines are not needlessly strained. (Roller all the way down, use the parking supports at the front.)

11.2 CHANGING THE TINES

To replace broken or worn tines, proceed as follows:

1. Loosen the nut and take off the tine (for the 8 mm and 10 or 12 mm tines).
2. As shown in Figure 8, you must hook on the new 10 or 12 mm tines and re-tighten the nut. Pay attention to the proper line spacing! The tines in the rear row cut the distance of the front tines in half.

3. As shown in Figure 8, the 8 mm tines must be fastened with the bolt. Ensure that the bolt rests firmly on the tine and that all tines form a straight line. The large washer should rest on the tine, and the small washer on the yellow plate.



Unscrew
the nut

Hook for fixing



Figure 8

Figure 9

11.3 TINE SAFETY

As standard, the GP series is equipped with a tine safety that prevent loss of the 12 mm tines by means of a rope. It protects the tines so that they do not get lost on the pasture or on the field. This also prevents damage to other implements, e.g. the mower or the baler.



Figure 10

12 TECHNICAL DATA

Type designation	GP 300 M1
Mode of operation:	Levelling with leaf springs with wear plate 2 rows of aggressive round spring tines 2 rows of harrow round tines Pressure-adjustable reconsolidation
Working width	3 m
Transport width:	3 m
Dimensions in m (W x H x D):	3 x 1.3 x 1.9 m
Working depth:	40 mm
Number of tines [Ø8/Ø12 mm]:	56 units / 40 units
Line spacing [Ø8/Ø10 mm]:	50 mm / 75 mm
Mounting/hitch:	linkage
Net weight:	1640 kg with Cambridge roller d = 530 mm 1290 kg with Cambridge roller d = 390 mm 730 kg GP 300 M1 without roller 910 kg Cambridge roller d= 530 mm without harrow 560 kg Cambridge roller d= 390 mm without harrow
Leading tools:	Levelling is spring-suspended and height-adjustable
Working tools:	Round spring tines
Ground adaptation:	Individual tine sections with a width of 1.5 m Oscillating bearing → Ground adaptation of 7 cm height is possible
Trailing elements:	Cambridge roller d = 530 mm or Cambridge roller d = 390 mm Toothed ring roller d = 410 mm
Minimum tractor performance:	65 kW
Special features:	All components can be used individually or in different combinations
Special accessories:	Operating hours counter Toolbox Lighting Platform kit for the seeder as of 2010
Can be equipped with:	PS 120 M1, PS 200 M1, PS 300 M1 with electric or hydraulic fan

13 ROAD TRANSPORT OF THE GP 300 M1

13.1 GENERAL

- Make sure than none of the safety splints or similar were lost during operation.
- Comply with the regulations of your country's legislation.
- Only relieve the hydraulic hoses at home by putting the tractor control unit into float position.
- The holder for the warning sign with lighting (optional equipment) is mounted on the carrier for the roller and should be positioned vertically to the road.
- If you are using a ground wheel for the pneumatic spreader with a side bracket, please remove it and hang it on the frame so that the transport width of 3 m is maintained.

13.2 CALCULATION OF THE WEIGHT RATIOS

If you want to drive with an implement that is attached to the 3-point linkage, you must ensure that you do not exceed the tractor's permissible axle loads and tyre load capacities with the mounted implement. The front axle of the tractor must be loaded with at least 20 % of the net weight of the tractor. All of these values can be determined with this calculation:

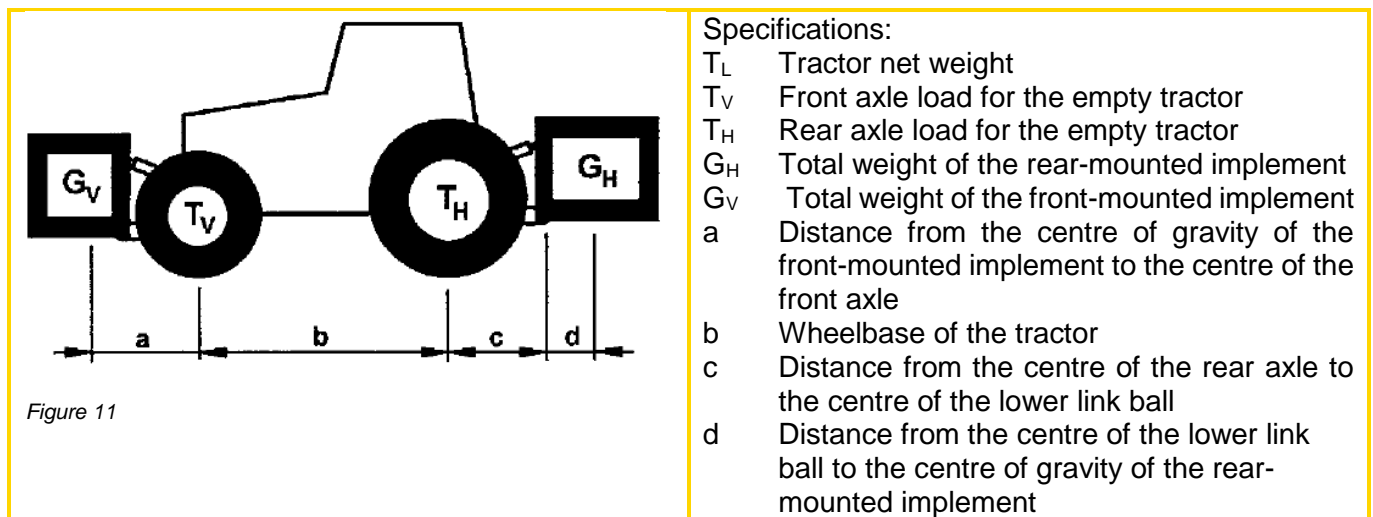


Figure 11

Weight calculations

1. Calculating the minimum front ballasting on rear-mounted implements $G_{V \min}$:

$$G_{V \min} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

This result is entered in the following table.

2. Calculation of the minimum rear ballasting for front-mounted implements $G_{H \min}$:

$$G_{H \min} = \frac{G_V \cdot a - T_H \cdot b + 0,45 \cdot T_L \cdot b}{b + c + d}$$

This result is also entered in the table on page 20.

3. Calculation of the actual front axle load $T_{V \text{tat}}$:

If the required minimum front ballast ($G_{V \min}$) is not reached with the front-mounted implement (G_V), the weight of the front-mounted implement must be increased to the weight of the minimum front ballast!

$$T_{V \text{tat}} = \frac{G_V \cdot (a + b) + T_V \cdot b - G_H \cdot (c + d)}{b}$$

Now enter the calculated actual front axle load and the permissible front axle load specified in the tractor operating manual in the following table.

4. Calculation of the actual total weight G_{tat} :

If the required minimum rear ballast (GH) is not reached with the rear-mounted implement (GH min), the weight of the rear-mounted implement must be increased to the weight of the minimum rear ballast!

$$G_{tat} = G_V + T_L + G_H$$

Now enter the calculated total weight and the permissible total weight specified in the tractor operating manual in the following table.

5. Calculation of the actual rear axle load $T_{H\,tat}$:

$$T_{H\,tat} = G_{tat} - T_{V\,tat}$$

Enter the calculated actual rear axle load and the permissible rear axle load specified in the tractor operating manual in the following table.

6. Tyre load capacity:

Enter the doubled value (two tyres) for the permissible tyre load capacity (see e.g. tyre manufacturer documents) in the following table.

PLEASE NOTE!

The minimum ballasting must be attached to the tractor as a mounted implement or ballast weight!

The calculated values may not be higher than the permissible values!

13.3 TABLE FOR THE WEIGHT RATIOS

	Actual value acc. to calculation		Permissible value acc. to operating manual		Double the permissible tyre load capacity (2 tyres)
Minimum ballast front/rear	kg				
Total weight	kg	≤	kg		kg
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

14 LIGHTING CIRCUIT DIAGRAM

Legend:

R	Right
1	12 V plug, 7-pin
2	Rear light, right
2.1	Turn signal
2.2	Rear light
2.3	Brake light
L	Left
3	Rear light, left
3.1	Brake light
3.2	Rear light
3.3	Turn signal

Plug and cable assignment

No	Desig.	Colour	Function
1	L	Yellow	Turn signal, left
2	54g	---	---
3	31	White	Earth
4	R	Green	Turn signal, right
5	58R	Brown	Rear light, right
6	54	Red	Brake light
7	58L	Black	Rear light, left

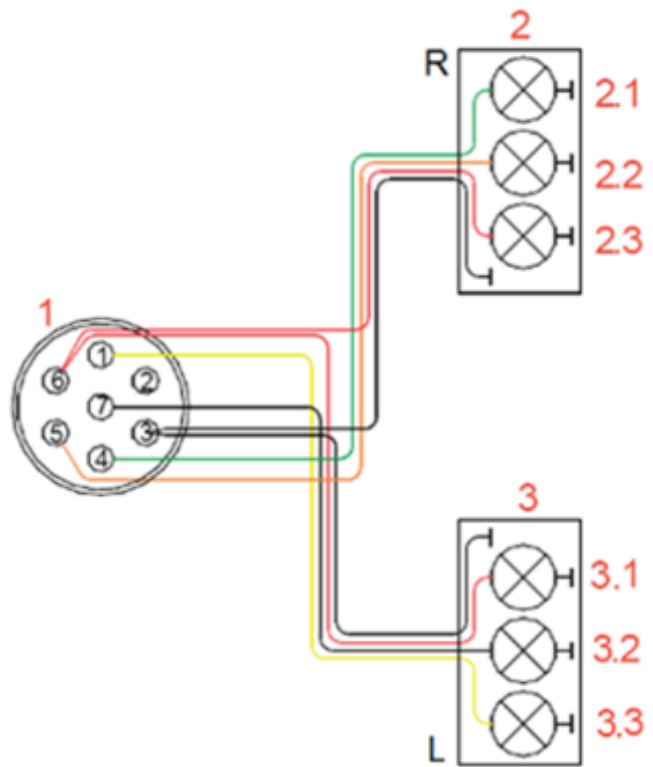


Figure 12

15 HYDRAULICDIAGRAM

Hydraulic roller adjustment:

Legend:

1	Control unit
2	Hydraulic couplings
3	Hydraulic roller cylinder
4	Hydraulic locking block

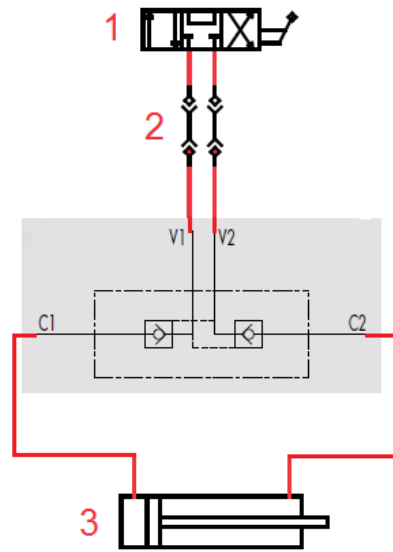


Figure 13

16 LUBRICATION SCHEDULE

The following bearing points must be regularly (approx. every 10 operating hours) lubricated with universal grease:



Figure 14: Position of the grease nipples

17 DECOMMISSIONING, STORAGE AND DISPOSAL

17.1 DECOMMISSIONING THE IMPLEMENT

To ensure that the implement remains fully functional, even if it is out of operation for longer periods of time, it is important to take precautions for storage: for this purpose, observe chapter 6.2 and 11.1.

17.2 STORAGE OF THE IMPLEMENT

- The implement must be stored in a dry place protected from weather conditions to ensure that it remains functional even if it is stored for a longer period of time.
- Secure the implement against unintentional rolling away.
- Nothing may be deposited or stored on the implement.
- The implement must always be parked and stored in a secure area, to prevent unauthorised operation.

17.3 DISPOSAL

Disposal of the implement must be performed according to the local disposal regulations for machines.

18 CROPPING TIPS FOR USING THE GP 300 M1

Seedbed preparation is always required before reseeding. This procedure is optimally accomplished with the 4 tine rows on the Grassland Pro Harrow GP 300 M1. Together with the reconsolidation with a roller, three working procedures are accomplished in one field pass.

With its thorough and effective mode of action, the GP 300 M1 can be optimally integrated in your overall management concept. The goal of your concept will be to improve yields and to increase the valuable grasses.

Other effects of the GP 300 M1, such as

- Soil aeration,
- Regulation of the water balance,
- Incorporation of the seed,
- Reconsolidation,
- Pressing down the seed and therefore
- Promoting tillering

make a significant contribution to the formation of good crops.

The success of weed control without chemicals and high yields, however, depend very strongly on you, as you will be required to closely observe the processes in your soil.

Reseeding of grassland is theoretically possible during the entire frost- and snow-free period. Gaps in the crops should already be reseeded in the spring to prevent weed competition. As a matter of principle, you should reseed more frequently and therefore work less aggressively and reduce the seed quantity.

Reseeding can be performed in the spring as soon as the soil has warmed up a little. The soil must have good trafficability, i.e. the seed should not be "smeared in" in any case.

Reseeding in the spring has the advantage that the spring humidity and the disturbed soil can be used as a seedbed. However, despite the good start, the grass can dry out during a summer drought, and the pressure of the old sward is greater in the spring due to the stronger growth spurt.

With the GP 300 M1, we counteract this disadvantage with a roller that presses down the seed and therefore improves soil contact. This allows the seed to germinate more rapidly and the risk of desiccation is reduced.

The optimal strength and depth setting, forward speed and the adjustment of the tines and seeding rate must be set with your understanding of the correlations between the soil properties and weather conditions, which can vary greatly in different regions.

19 ACCESSORIES

- **Lighting with warning signs (on both sides)**

Is required when the GP is transported on public roads.

Item no.: 06001-2-021



Figure 15

- **Operating hours counter**

A vibration sensor detects the vibrations of the implement and starts the operating hours counter.

Item no.: 00602-3-659



Figure 16

- **Access platform for GP 300 M1**

For easier filling of the PS implement, if equipped.

Item no.: 06000-2-034



Figure 17

- **GP 300 dispersion plate installation accessories kit**

Item no.: 06000-2-012

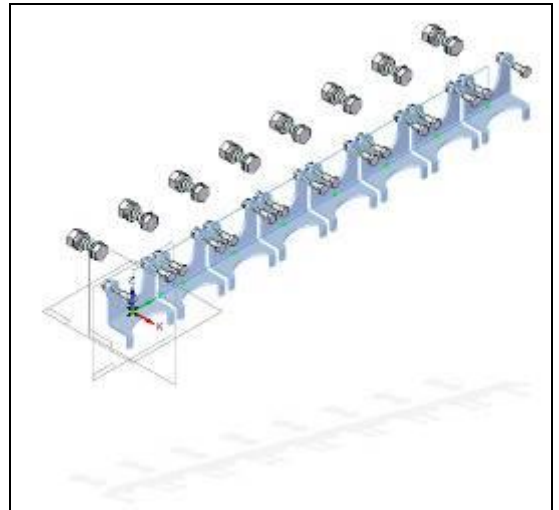


Figure 18

- **Toolbox accessories kit**

Item no.: 06004-2-115



Figure 19

- **Sensor set – Radar + top link lifting unit sensor for GP 300**

Item no.: 06000-2-013

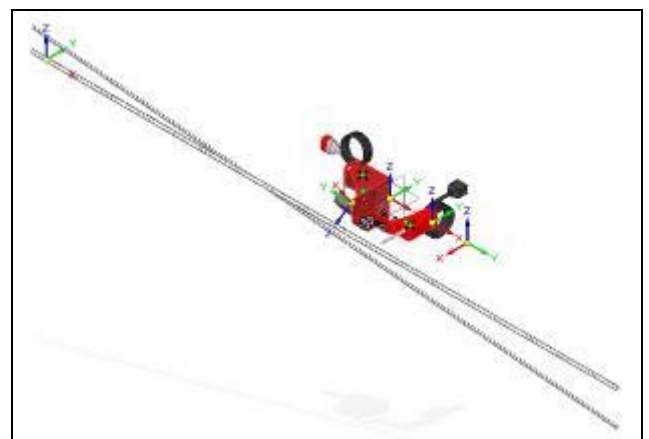


Figure 20

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